

ABSTRACT

TITLE: “Comparative evaluation of the effects of Etomidate versus midazolam on hemodynamic stability during induction in patients with impaired left ventricular function undergoing cardiac surgery.”

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Background:

Anesthetic induction and maintenance may cause hypotension which may result in grave consequences in patients with coronary artery disease especially when there is associated left ventricular dysfunction. A primary goal is to attenuate the stress response to endotracheal intubation and to prevent hypotension. It is a well-known fact that etomidate has a very stable cardiovascular profile. However it is known to suppress the cortisol levels which are involved in stress response. The objective of this study is to compare the effect of etomidate and midazolam on hemodynamics during induction in patients with impaired left ventricular function (EF 30-45%) who are undergoing coronary artery bypass grafting.

Methods:

49 patients with mild to moderate left ventricular dysfunction (ejection fraction 30-45%) were randomly assigned to two groups after getting informed consent. Patients who were scheduled for elective CABG were only included in the study. The exclusion criteria were- associated valvular heart disease, persistent arrhythmias, congestive cardiac failure, on mechanical ventilation, emergency surgery, renal disease, known adrenal insufficiency, history of steroid use in the preceding six months, and those with severe systemic non-cardiac disease, other than diabetes and hypertension. Patients with critical left main coronary disease and severe left ventricular dysfunction (Ejection fraction (EF) < 30%) were also excluded from the study. Randomization was done through computer based random allocation as sealed envelopes. The variables like HR, SBP, MAP, DBP, ST segment, PPV were analyzed and documented at 1 minute after induction, 1 minute after intubation, 3 minutes after intubation and 5 minutes after intubation. Any rise or fall within 20% of base line or a MAP < 60 mmHg was considered significant. As we were monitoring this continuously we treated it aggressively if the values went beyond 20%.

Results:

There was no significant difference in heart rate among both the groups. Etomidate was more hemodynamically stable as seen by the serial MAP values which were consistently not less than 20% of baseline in the etomidate group. There was significant difference in the MAP value 1 minute after intubation, while the stress response to intubation was similar in both the groups.

A single dose of etomidate did not cause significant adrenal suppression. There was a significant difference in the number of ICU days in the etomidate group which was contrary to literature.

Conclusion:

1. Etomidate offered significantly better hemodynamic stability compared to midazolam for induction of anesthesia in coronary artery disease patients with mild left ventricular dysfunction.
2. Etomidate was comparable to midazolam in suppressing hemodynamic response to intubation in the study population.
3. Even though etomidate suppressed the immediate stress response to surgery, the serum cortisol levels were within normal limits and reached a comparable value by 24 hours. Also the inotrope score, ICU stay and hospital stay were better in etomidate group indicating that the adrenal suppression is not clinically significant.

Keywords: induction agents, hypotension, stress response, left ventricular dysfunction